

What is claimed is:

1. A light source device comprising:

two or more light emission boards each having three types of light emitting diodes for emitting red, green, and blue light, said light emitting diodes being arranged in matrix in a predetermined ratio;

polarized light forming means each opposing said light emission board associated therewith for receiving illumination beams of randomly polarized light emitted from said respective light emitting diodes, uniformly converting the illumination beams to the same type of linearly polarized light, and directing the linearly polarized light beam therefrom; and

illumination beam combining means for transmitting or reflecting the incident linearly polarized light beams depending on the type of polarized light to combine the incident linearly polarized light beams orthogonal to each other into a single direction for emission therefrom.

2. The light source device according to claim 1, wherein said illumination beam combining means includes a polarized light separation surface formed therein and extending at 45° to the optical axis of the incident light beam, said illumination beam combining means relying on the action of said polarized light separation surface which transmits or reflects polarized light incident thereon depending on the type of the polarized light to combine the incident light beams orthogonal to each other into a single direction for emission therefrom.

3. The light source device according to claim 2, wherein said polarized light separation surface is formed in a V-shape within said

illumination beam combining means.

4. The light source device according to claim 1, wherein said illumination beam combining means comprises a wire grid type polarizer.

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5. The light source device according to claim 1, further comprising illumination beam converging means disposed between each of said light emission boards and each of said polarized light forming means for converging the illumination beams of the randomly polarized light emitted from said light emitting diodes.

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6. The light source device according to claim 5, wherein said illumination beam combining means includes a polarized light separation surface formed therein and extending at 45° to the optical axis of the incident light beam, said illumination beam combining means relying on the action of said polarized light separation surface which transmits or reflects polarized light incident thereon depending on the type of the polarized light to combine the incident light beams orthogonal to each other into a single direction for emission therefrom.

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7. The light source device according to claim 6, wherein said polarized light separation surface is formed in a V-shape within said illumination beam combining means.

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8. The light source device according to claim 5, wherein said illumination beam combining means comprises a wire grid type polarizer.

9. A projection display having a light source device and illumination beam modulating means for modulating an illumination beam emitted from said light source device to generate a projection image for display on a projection surface, wherein:

5 said light source device comprises:

two or more light emission boards each having three types of light emitting diodes for emitting red, green, and blue light, said light emitting diodes being arranged in matrix in a predetermined ratio;

10 polarized light forming means each opposing said light emission board associated therewith for receiving illumination beams of randomly polarized light emitted from said respective light emitting diodes, uniformly converting the illumination beams to the same type of linearly polarized light, and directing the linearly polarized light beam therefrom; and

15 illumination beam combining means for transmitting or reflecting the incident linearly polarized light beams depending on the type of polarized light to combine the incident linearly polarized light beams orthogonal to each other into a single direction for emission therefrom, and

20 said illumination beam modulating means comprises a digital mirror device (DMD).

10. The projection display according to claim 9, wherein:

said illumination beam combining means includes a polarized light separation surface formed therein and extending at 45° to the optical

25 axis of the incident light beam, said illumination beam combining means relying on the action of said polarized light separation surface which

transmits or reflects polarized light incident thereon depending on the type of the polarized light to combine the incident light beams orthogonal to each other into a single direction for emission therefrom.

5 11. The projection display according to claim 10, wherein said polarized light separation surface is formed in a V-shape within said illumination beam combining means.

12. The projection display according to claim 9, wherein said
10 illumination beam combining means comprises a wire grid type polarizer.

13. The projection display according to claim 9, further comprising illumination beam converging means disposed between each of said light emission boards and each of said polarized light forming means for
15 converging the illumination beams of the randomly polarized light emitted from said light emitting diodes.

14. The projection display according to claim 9, wherein:
 said illumination beam combining means includes a polarized
20 light separation surface formed therein and extending at 45° to the optical axis of the incident light beam, said illumination beam combining means relying on the action of said polarized light separation surface which transmits or reflects polarized light incident thereon depending on the type of the polarized light to combine the incident light beams orthogonal to each
25 other into a single direction for emission therefrom.

15. The projection display according to claim 14, wherein said polarized light separation surface is formed in a V-shape within said illumination beam combining means.

5 16. The projection display according to claim 13, wherein said illumination beam combining means comprises a wire grid type polarizer.